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Chemistry of Bonding between Asphalt and Aggregates

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Abstract: Pavement systems in Saudi Arabia are exposed to a multitude of severe environmental factors, mainly the high temperature and high humidity. Humidity (moisture) damage to asphalt-aggregate paving mixtures is well known. These adverse effects cause premature road failure and waste of valuable resources. Moisture damage of asphalt pavements are generally believed due to the debonding of asphalt from mineral aggregate. A number of factors affect the debonding of asphalt from aggregate in a road pavement. These factors include the chemistry and composition of the asphalt and the aggregate, the specific bonding interaction between the asphalt and the aggregate, and the resistivity to moisture to a particular asphalt-aggregate combination. This study provided important information regarding chemical interactions that occur between Arab asphalts and locally used aggregates.